

Application No. 09/869,638
Filed: February 8, 2002
TC Art Unit: 2621
Confirmation No.: 5891

REMARKS

The Applicants acknowledge with appreciation that the previous rejections for obviousness have been withdrawn. The Examiner has now imposed new rejections - for indefiniteness of claims 1-15 and for obviousness of claims 1-15 over Luck et al. in view of Watanabe, alone and in combination with Hemstreet III et al. These rejections are respectfully traversed for the reasons given below and reconsideration is requested.

Claim 1 has been amended to insert "in said first microscope image" in two places. Also, the limitations of claims 10 and 12 have been incorporated into claim 1 and claims 10 and 12 cancelled.

Applicants' cancellation of certain rejected claims is not to be construed as an admission that the Examiner's rejections were proper. The Applicants continue to believe that the rejected claims are described in and enabled by the specification, and are not obvious in view of the cited references, as previously argued. The rejected claims have been cancelled for the sole purpose of advancing the case to allowance. The Applicants reserve the right to file a continuing application to continue the prosecution of the rejected claims.

The present invention is directed to a method for the automatic analysis of microscope images of biological objects, which is particularly useful for the analysis of fluorescence images of cells. The Applicants reaffirm their earlier arguments as to the characterization of the prior art and the patentability of the instant claims directed to this invention and add new arguments below to address the new grounds of rejection.

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Rejection under 35 U.S.C. § 112 for indefiniteness

The Examiner objects to the recitation in steps d and e directed to "feature combinations." With respect, the Applicants remind the Examiner that this wording was part of the claim language as originally filed and, thus, was part of the original specification. Furthermore, the original claims are paraphrased in the summary of the invention section of the application as filed, specifically, e.g., at p. 4, line 15. The Examiner makes a point that the description of the invention at p. 8 does not mention combining these features; however, p. 8 contains a description of the preferred embodiment of the invention and does not purport to characterize the full scope of what is claimed.

The Examiner also objects to the Applicants' description of a classification value, finding it a problem that the specification at p. 9, first full paragraph, discloses that the feature sets are set to either "1" or "0" and stating that this creates an inconsistency when compared with the claims. The Applicants point out that the Examiner is misreading this section of the specification. The description at p. 9 is of how to carry out steps b and c. Practice of step d is described starting at the top of p. 10 and continuing for the rest of the page.

Rejection under 35 U.S.C. § 103(a) for obviousness

Claims 1-3, 6-12 and 14 are newly rejected as obvious over Luck et al. in view of Watanabe. The Applicants reaffirm their previous arguments as to the mischaracterization of the Luck et al. disclosure by the Examiner. Further, the Applicants point out that the way the Examiner is now characterizing Luck et al., e.g., at p. 4 in the Office Action, no. 7.b), is irrelevant to the

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Applicants' invention. In this paragraph, the Examiner purports to be pointing to places in Luck et al. that teach step b of Applicants' claim 1. However, step b is carried out on the same microscope image, a "first" microscope image, not using "malignant and benign cells" as taught by Luck et al., which step clearly requires more than one microscope image. The Examiner exhibits this same confusion when talking about step c in Applicants' claim 1, which recites "selecting and marking a number m of second image excerpts each spaced a predetermined minimum distance from said first image excerpts." Since the second image excerpts are required to be "spaced" from "said" first image excerpts, they clearly by this wording are required to be "in said first microscope image." However, this language has now been added to step c and step e to leave no room for doubt.

The Applicants are confused by the Examiner's reference to Watkin at two places on p. 6 of the Office Action. Is Watkin part of the present obviousness rejection or not? Watkin is referred to again at p. 7.

The Examiner then looks to Watanabe to obtain the other acknowledged "missing piece" from Luck et al., that the reference "does not disclose using 1 and 0 for training a neural network." Watanabe, however, does not do anything more than to briefly mention values of 0 and 1 for the same variable (col. 5, lines 59-61) in the context of a "neuralnetwork and learning method." Applicants explicitly point out that the cited text passage in Watanabe relates to the same variable y, which can have two different values. It is clearly based on a hindsight approach for the Examiner to use Watanabe in this manner. In addition, even if the references are combined, the combined disclosures still would

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not teach all the elements of the Applicants' claim 1, as argued above.

In the Examiner's response to the Applicants' previous arguments, the Examiner asserts that the Applicants do not disclose classifying cells by recognition of their positions and cites to p. 8 and to a description of Applicants' use of principal component analysis. The Applicant points out that in this portion of the description of the preferred embodiment, they are describing a calculation method. The application of this method is described on p. 10, starting about line 14.

At p. 11 of the Office Action, the Examiner graciously describes what he believes is the source of confusion in this case. While the Applicants disagree with the Examiner's analysis, they appreciate the concern and request that the Examiner discuss this matter with their undersigned attorney before acting again on this application. In regard to the Examiner's statement that the "positive training set" of the claims is only a half of a full training set, the Applicants urge the Examiner to reread the cited portion of the specification at p. 9 in the context of the disclosure at p. 3 and p. 4. At p. 3, positions of mass gravity centers are identified, each of these positions assigned a defined first image excerpt and each first image excerpt assigned the value 1. Then, at p. 4, a number of second image excerpts, spaced away from the first image excerpts and, therefore, having less mass gravity than the mass gravity centers, are assigned the value 0. The Applicants define these two types of sets as the "positive" and "negative" training sets, respectively. This procedure is described again in the context of a preferred embodiment at p. 8, lines 1-21. In this context, the Applicants' teaching at p. 9,

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lines 5-8, can be seen as representing the calculation portion of the method described at p. 8. Variable y_a will be set to 1 for the positive training set and to 0 for the "negative ones," the negative training set. Variable y_a has only one value in a given (input, output) pair.

Thus, the Applicants submit that the rejection of claim 1 as obvious over Luck et al. in view of [Watkin and?] Watanabe has been overcome.

The Examiner has, furthermore, rejected dependent claims 2, 3, 6-12 and 14 as obvious over these cited references. The Examiner submits that the indicated claims are allowable for being dependent on an allowable base claim, as discussed above.

In regard to dependent claims 4, 5, 13 and 15, the Examiner has rejected them as obvious over the previously cited references and further in view of Hemstreet, III et al. The Applicants submit that the Hemstreet, III et al. disclosure in no way supplies the deficiencies in the primary references, as recited above, and, therefore, this rejection, too, has been overcome.

Thus, the Applicants submit that all claims are in condition for allowance and such action is respectfully requested.

For the Examiner's information, enclosed herewith is a copy of the European patent granted on the European counterpart to the instant application. The Examiner is referred to the English version of the claims.

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The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

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